NAV—R 1/33.

REPORT

ON

THE PROGRESS OF CIVIL AVIATION, INDIA

1932-33



GOVERNMENT OF INDIA

DIRECTORATE OF CIVIL AVIATION.

ELHI MANAGER OF PUBLICATIONS
1933

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INTRODUCTION

This report is compiled to cover developments in the period up to the 31st March 1933 but all statistics are given for the calendar year 1932 for ease of comparison with those of other countries

In spite of retrenchment both in Government and private expenditure the year has not been without development in civil aviation. Perhaps one of the most important features of the year, however, is the ever growing accumulation of signs of widening interest in aviation, and particularly an awakening of interest in the possibilities of commercial aviation in India This has sprung, not only from a possibly envious observance of the benefits conferred by air transport in other countries but also to some extent as might naturally be expected, from the fact that there is a growing body of trained pilots in the country, who have naturally turned their attention to the useful employment of their accomplishments, while at the same time the Clubs have spread their activities from their own centres into more and more surrounding localities

An increasing number of Indian States is taking up flying and providing flying organisations From Jodhpur, which easily retains the lead, the movement has spread to the Kathiawar States, to Patiala and finally to Hyderabad

In actual commercial development the year is marked by the beginning of air transport operations by Indian organisations, two Indian air mail services having been inaugurated with a total of 2,010 miles of route operated

The year closed with very definite indications that the development which has now begun is the beginning of an expanding phase, many results of which should be apparent within the next two years

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By courtesy of Indian Air Survey and Transport Ltd.

CALCUTTA—BY INFRA RED PHOTOGRAPHY

The photograph taken from a height of 13,000 feet in poor visibility shews a range of about 75 miles. In the *middle distance is the Howrah bridge crossing the Hooghly river*, in the left foreground the Maidan and on the right the marshes which adjoin Calcutta



By courtesy of Indian Air Survey and Transport Ltd

CALCUTTA—BY INFRA RED PHOTOGRAPHY

The photograph taken from a height of 13 000 feet in poor visibility shews a range of about 7[illegible] miles In the middle distance is the Howrah bridge crossing the Hooghly river in the left foreground the Maidan and on the right the marshes which adjoin Calcutta

The service was regularly operated up to the end of the period under review *viz*, 31st March, but on one occasion there was a delay of one day in the southbound service due to unserviceability of machines, in addition to the delays in the southbound service caused by late arrival of the overseas service

Statistics covering the operations to the end of the calendar year 1932, will be found in Appendix I

Negotiations for the extension of the Karachi Madras air mail service to Colombo are in progress As soon as agreement is reached, steps will be taken towards the commencement of the service which, it is hoped will be inaugurated not later than October 1933 The mileage of this section of the route is 425 No intermediate stops are contemplated and the service will probably be operated by seaplane or amphibian

(2) *Karachi Delhi Air Mail Service*—The Delhi Flying Club continued to operate the air mail service between Karachi and Delhi throughout the year 1932 The agreement was renewed on the 31st December 1932, the date of its expiry

The route mileage of this service is as follows —

	Miles
Karachi Hyderabad*	100
Hyderabad-Jodhpur	290
Jodhpur Delhi	300
TOTAL	690

*NOTE —Hyderabad is a stopping place only on the westbound service

The night stop at Hyderabad for connection with the southbound Punjab mail train proved of considerable value, particularly during the summer when the Government of India are located in Simla As
the Tata
ceased
ne Delhi
service in consequence, the normal growth of air mail traffic operated to maintain the average load without decrease The only other operational change during the year was necessitated by the strong westerly winds during the summer months and the absence of night lighting organisation To meet this difficulty, the scheduled time of departure from Delhi was changed for that season from 09 30 to 07-30, which resulted in some minor late train connections being no longer available Floodlights have now been provided and it is hoped that this will obviate the necessity for a change during the monsoon of 1933

Although 104 services were operated, there were only three occasions when the westbound service failed to make connection with Imperial Airways at Karachi, two of these being due to forced landings on account of weather (sandstorms and thunderstorms) and one due to forced landing on account of mechanical failure

The total weight of mail carried during the calendar year 1932 was 10 066 lbs —an average of 99 6 lbs per flight—compared with 8 295 lbs in the previous year (Charter Service)

The service was operated with a De Havilland Gipsy II Moth with a De Havilland Puss Moth as relief machine It is worthy of note that, except on one occassion the service has been operated by an Indian pilot entirely trained by the Delhi Flying Club

Statistics covering the operations during the calendar year 1932 will be found in Appendix II

(3) *Projected developments*—Negotiations, which were carried on during the year for the establishment of an air mail service from Karachi to Moghal Serai to improve the service to Calcutta and in substitution for the Karachi Delhi service were abandoned in favour of a larger scheme to form part of an extension of the British air service to Australia At the time of this report, negotiations are still in progress but it is expected that they will result in the establishment of an air service across India during 1933

External and Foreign Air Services

(1) *Imperial Airways London Karachi Air Service*—Throughout the year the service was operated to the same time table —

Eastbound

London dep	Saturday
Karachi arr	Friday

Westbound

Karachi dep	Wednesday
London arr	Tuesday

The four engined Handley Page 42 type of aeroplane was used throughout the year, and did much to establish an enhanced reputation for the comfort of the service

Changes in the route, of considerable importance, took place during the year These while not directly the concern of India were of interest to the Indian public

(i) The most important change took place on the 1st October 1932 Hitherto the service had been operated, since 1929, along the Persian shore of the Persian Gulf, *via* Basra, Bushire, Lingeh, Jask and Gwadar The permission of the Persian Government to operate along this route which had been twice temporarily extended, expired on the 30th September With the co operation of the Sheikhs of Bahrein and Sharjah, a route was organised along the Arabian shore of the Gulf and the service is now operated *viâ* those places and rejoins the original route at Gwadar

(ii) In order to shorten the route across the Mediterranean, which had hitherto been operated *viâ* Cairo, duplicate flying boat services were operated for the African and Indian services throughout the year

As the result of this change the Indian service operated viâ Athens, Cyprus and Galilee, where the change from flying boat to landplane was made for the flight to India *viâ* Rutbah Wells and Baghdad Whilst the change had excellent results during the summer, it was found that the
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ality of the service, which gave rise to much criticism in India To avoid these conditions during the bad period a reversion to the original route *via* Athens and Alexandria was effected in January 1933 An immediate improvement in punctuality was recorded

Statistics with regard to the regularity of operation of the service are combined with those of other services now carrying Indian mails and *mails to India in Appendix III* for the years 1931 and 1932

*The actual time taken by the service on flights eastbound and west*bound between London and Karachi is shewn below —

Eastbound		Westbound	
No of flights	Day of arrival	No of flights	Day of arrival
36	7th	36	7th
6	8th	12	8th
7	9th	3	9th
4	10th	1	5th
Total 53		52	

The scheduled day of arrival is the seventh day from the day of departure which means that the actual elapsed time on the eastbound flight is approximately 6 days and on the westbound flight 6 days and eight hours

The saving of time which this represents as compared with the sea mail service is in some parts of India considerably diminished by the absence of internal air mail services and the lengthy train journey from Karachi So far as South India is concerned, this disadvantage has been wholly removed by the inauguration of the Karachi Madras air mail service

There have been only comparatively slight increases in the weight of air mails carried on the service as compared with 1931, a result no doubt due in part to the trade depression

	To India		From India	
	1931	1932	1931	1932
	lbs.	lbs.	lbs	lbs
Mails for India	45 632	45 111	40 474	4[illegible] 40[illegible]
Transit mails	840	1,766	2 [illegible]9[illegible]	4,299
Total	46 4[illegible]2	46 8[illegible]7	43 066	46 [illegible]06

Complete mail statistics are given in Appendix IV combined with the figures for foreign services Further operational statistics including traffic figures of passengers and freight are given in Appendix V A point worthy of note is that the passenger traffic increased approximately 50 per cent as compared with the previous year

(2) *K L M (Royal Dutch Air Lines) and Cie Air Orient (French) Air Services*—No new foreign services were inaugurated during the year under review Both the Dutch service from Amsterdam to Batavia, and the French service from Paris to Saigon were operated throughout the year

The number of flights carried out by the Dutch (K L M), and French (Compagnie Air Orient), services across India during the year 1932 was —

	Eastbound.	Westbound.	Total.
Dutch	52	52	104
French	43	43	86

From the 15th May 1932, the French (Compagnie Air Orient) service was operated weekly in each direction, both the Dutch and French companies now run their services on a weekly basis The Dutch service continued to be operated mainly by Fokker F XII and F XVIII aircraft, and the French service by Fokker F VII

An important change of policy with regard to the use of these services for the carriage of Indian air mails was given effect on the 27th September 1932 Hitherto they had carried mails to India and had delivered them to the Postal authorities at the aerodrome of entry Both services are now used for the carriage of air mails to countries east of India which are served by them *viz* Siam Indo China Federated Malay States and Netherlands East Indies In addition the services are used for the carriage of air mails from Rangoon to

Calcutta, which are consigned by the Delhi-Karachi service and thence by Imperial Airways to countries in the west

Statistics with regard to the weight of air mails carried by these services to and from India are given in Appendix IV.

Operational statistics, including passenger and freight traffic data are combined with those of Imperial Airways in Appendix V

Statistics with regard to the regularity of operation of these services are combined with those of Imperial Airways in Appendix III

IMPORTS AND EXPORTS BY AIR

There was a notable increase both in the number of aircraft cleared and in the value of imports and exports by air through Indian air ports.

The number of aircraft arrivals from abroad was 271 compared with 179 in 1931 The number of aircraft departures for abroad was 268 compared with 176 in 1931

Compared with a value of Rs 1,50,601 merchandise imported in 1931, the value in 1932 was Rs 8,28,786 which included a consignment of diamonds valued at Rs 4,17,169 The imports of bullion and currency notes declined from Rs 1,06,801 to Rs 33,766

The exports of merchandise were small, amounting to Rs 15,353 compared with Rs 4,286, but the exports of bullion and currency notes increased from Rs 14,54,790 in 1931 to Rs 24,58,563 in 1932

Detailed statistics are given in Appendix VI

SECTION II —FLYING CLUBS AND PRIVATE FLYING

(1) *Flying Clubs* —On the whole good progress in the flying club movement was maintained, the only set back being the cessation of the activities of the Punjab Flying Club A summary of the work of the flying clubs is given in Appendix VII

The flying clubs at Karachi, Delhi, Bombay, Calcutta and Madras continued operations on a subsidised basis The Government subsidy was reduced, as compared with the previous year, by an amount of Rs 6,000 for each club, the basis of payment being as follows —

	Rs
Fixed subsidy .	17,000
Bonus at the rate of Rs. 100 for each pilot trained *ab initio* and licensed (Maximum)	2,000
TOTAL	19,000

The Aero Club of India and Burma, which, in addition to its function of representing the Federation Aeronautique Internationale in India, and its responsibility for the organisation of the sport of flying

and air touring, is responsible for assisting Government with the administration of the flying clubs and co-ordinating their activities, also suffered a cut in subsidy from Rs. 20,000 to Rs 16,000.

It may be noted here that it has been decided to impose further cuts in the subsidy for the financial year 1933-34 The flying club fixed subsidy will be reduced to Rs 16,000 and the Aero Club subsidy to Rs 5,000 These cuts will provide funds for the payment of a subsidy to the United Provinces Flying Club in 1933-34

The Cawnpore and Lucknow centres of the Delhi Flying Club continued operation throughout the year, and at the end of the year arrangements were made for their incorporation as a separate United Provinces Flying Club, which will receive a Government subsidy. The Club has received a good measure of private support One aeroplane and a hangar for Lucknow have been donated while funds have been collected for a hangar at Cawnpore Operations will continue at both centres There is evidence that the establishment of this new club will arouse interest and enable occasional facilities for flying to be provided in the eastern United Provinces and Bihar

The Jodhpur Flying Club, though handicapped by small membership and unable therefore to produce results comparable with those of the larger centres, continued to operate Its value as an established flying centre, however, is out of proportion to the actual number of hours flown The maintenance of Jodhpur as a flying centre for private flying, and its development as a commercial aerodrome are due to the keen interest taken by His Highness the Maharajah Towards the end of the year, two Monospar aeroplanes were purchased and arrangements made for the Club to provide agency and service facilities for this type of aircraft

Despite lack of Government support, the Kathiawar Flying Club came into active existence in April 1932 It was at first centred at Rajkot in Kathiawar, but later moved its headquarters to Ahmedabad, where it is established on the Military landing ground While it was established by individual initiative and is supported by private financial assistance, it is becoming organised as a membership club. Rajkot is still maintained as a branch centre Two pilot instructors are employed

Government support was withdrawn from the Punjab Flying Club on the expiry of the agreement in March 1932 The Club ceased to operate, having no serviceable aircraft and no staff Steps were taken to apply for the liquidation of the Club, and a Receiver was appointed in March 1933 The initial steps in the formation of a new Club at Lahore have been taken and it is hoped that this will come into operation during 1933.

The Madras Flying Club have made arrangements to extend their activities to Trichinopoly The Bengal Flying Club considerably improved the amenities of the Club by the provision of a new Club house on the Dum Dum aerodrome The Bombay Flying Club which has

always made a practice of extending its activities to surrounding centres continued to do so During the monsoon, the whole of the operations of the Club were transferred to Poona

The tot

on account

membershi

with 1 880

craft owned by flying clubs from 20 in 1931 to 26 in 1932 There was also an increase in the total number of hours flown from 9 070 to 9 717 In view of the smaller number of pilots trained, this must be partly ascribed to greater activity in passenger flights, and hence represents a widening of interest in flying

On account of the closing of the Punjab Flying Club and a temporary suspension of activities (for leave purposes) of the Karachi Aero Club, there was a decrease in the number of pilots trained *ab initio* from 113 to 85 Of this number 44 were Indians and 41 Europeans Several of the clubs turned their attention to the advanced training of pilots who wished to take up flying as a profession The following numbers were trained and obtained the appropriate licence —

Pilot Instructors	1 (Madras)		
B Licence (Full Commercial Pilot s Licence)	2	Bengal	1
		Delhi	1
A1 Licence (Limited Commercial Pilot s Licence)	5	Madras	1
		Delhi	3
		Bombay	1

In addition a trainee of the Delhi Flying Club who has been taught *ab initio* and successively obtained his "A" and "B" licences was given a grant of Government assistance, and sent to an instructor's school in England for a full course as a pilot instructor He passed through the course with distinction and was thereafter granted a Pilot Instructor s Licence

The total number of passengers carried by the flying clubs on taxi and short pleasure flights was 4 972 compared with 3 247 in 1931

The number of hours flown by privately owned aeroplanes was approximately 682

There has been a natural increase in the number of personnel engaged by the Flying Clubs The figures at the end of December 1932 were —

	Technical	Clerical	Menial	TOTAL
Europeans	16			16
Indians	23	23	62	108
TOTAL	39	23	62	124

During the year, there has been a large extension of the training facilities in aircraft engineering offered by the flying clubs It has to be understood that the facilities are somewhat limited on account of a number of factors among which may be noted (1) that the clubs are [illegible] fully qualified [illegible] that the clubs [illegible] the types of [illegible] Nevertheless, with these limitations in mind it has been possible for mechanics employed by or apprenticed to the clubs to be trained to the standard necessary to qualify for a limited ground engineer s licence During the year three ground engineers licences have been issued after examination by the staff of the Directorate of Civil Aviation to mechanics trained by the flying clubs On the 31st December 1932, the following numbers were under training —

Premium apprentices	10
Free tuition	13

In addition, most of the Indian mechanics shewn above as paid staff of the clubs are still receiving training to qualify for licences as ground engineers or extensions to their licences

The annual conference of flying club representatives was held in Delhi on the 12th February 1933, when a large number of representatives was present in connection with the Viceroy s Trophy Air Race Matters of considerable importance were discussed and agreement reached in principle The future support of the Aero Club of India and Burma in view of the reduction of the Government subsidy was decided as being of vital interest to the flying clubs and provisional measures to that end were agreed The most important problem facing the clubs is that of making themselves self supporting Analysis of the operational results over a period of years shews that the total costs are in the neighbourhood of Rs 50 per hour flown while the average income of the clubs from flying fees is approximately Rs 25 Uniform rates of flying fees as between the different clubs and a general increase in flying fees were agreed on as the first step towards the reduction of the disparity These measures have now to be given effect to by the individual clubs

(2) *Viceroy s Trophy Air Race* —The hope that this race would become the most important national aviation event in India and would attract attention from abroad gives promise of being well founded The race this year was held on the 10th February 1933 There were 17 entries and 12 starters including two Comper Swifts which had flown from England for the purpose of competing The starting machines included —

5 D H 60 Moth, Gipsy I

2 D H 60 Moth, Gipsy III

2 D H 80 A Puss Moth, Gipsy III

2 Comper Swift, Pobjoy

1 Comper Swift, Gipsy III

The race started and finished at Delhi and was flown round the following course —

	Distance Miles
Delhi	
Bareilly	138
Lucknow	141
Agra	181
Rampur	128
Delhi	111
TOTAL	699

The race, a handicap speed race was open to all pilots Ten pilots completed the course including one lady pilot The other two pilots retired from the race and flew back to Delhi

The Viceroy's Trophy was won by Captain A I Riley A F C the chief pilot instructor of the Delhi Flying Club flying a Gipsy I Moth at an average speed round the course of 115 6 m p h The speed of the winner in last year s race was 96 1 m p h The fastest time round the course was made by F/0 G G Stead flying a Comper Swift Gipsy III engine at an average speed of 153 m p h This compares with the fastest speed of 120 5 m p h made by a Puss Moth in 1931

The Irwin Flying Fund Committee again made a contribution towards the provision of prize money

(3) [illegible]
Indians [illegible]
non Inc [illegible]
were distributed as follows —

British	14
French	3
German	1
American	2
Australian	2
Canadian	1
Czechoslovakian	1
Spanish	1
Swiss	1

The 14 British flights included a flight from India to England and back in an Indian registered aeroplane by a British pilot with an Indian engineer

There was one accident in connection with these flights with unfortunately fatal results This was the loss at sea near Rangoon of two British planters Messrs G W Salt and F W Taylor residents of Malaya who were flying to England Having left Moulmein for Rangoon they failed to arrive Extensive searches were instituted by

the Government of Burma and the Government of India by land, sea and air but no trace of the aviators was found

SECTION III —ACCIDENTS

There was a slight increase in the number of accidents to Indian aircraft during the year. In the following table, major accidents are those which involved a fatality or serious injury to personnel, minor accidents involved damage to aircraft only —

Class of Flying	Major	Minor	TOTAL
Indian Registered Aircraft			
(1) Regular Air Transport		1	1
(2) Other flying for hire			
(3) Club flying	3(2)*	12	15
(4) Private flying		3	3
Indian Unregistered Aircraft			
Private flying	1		1
TOTAL (INDIAN AIRCRAFT)	4	16	20
Non Indian (British) Aircraft			
(1) Regular Air Transport			
(2) Private flying	1*	1	2
TOTAL (NON INDIAN)	1	1	2
TOTAL (ACCIDENTS IN INDIA)	5	17	22

* Fatal accidents—four deaths (one presumed)

The major accidents are briefly described below —

(1) A pilot at Lahore, while flying over the town at low altitude stalled his machine. The machine was written off and the passenger killed. The pilot was prosecuted for a breach of the Indian Aircraft Rules with regard to low flying

(2) At Delhi on the 14th May a valve seat failure occurred just after the aeroplane had taken off from the aerodrome. The machine landed on rough ground and was written off. The pilot sustained minor facial injuries

(3) On the 7th June a machine belonging to the Bombay Flying Club, flown by a member of the Club disappeared. No trace of pilot or machine was ever found. It is presumed that the pilot flew the machine to sea and was drowned

(4) In October a serious accident occurred to an old war time Avro which was neither registered nor certified as airworthy, while flying in an Indian State, the accident was due to the breakage of the member carrying the control column bracket. The breakage occurred at a low altitude, the machine got into a spin and was completely written off

The pilot (unlicensed) suffered exten^ive injuries Aircraft flying in Indian States do not come under the control of the Civil Aviation Direc torate

(5) On the 12th August two Malay planters flying together in an Avro Avian *en ro ite* for England from the Malay States left Moulmein for Rangoon While various subsequent reports indicated that an aeroplane had been seen flying in the vicinity of the coast the most exhaustive search by air sea and land failed to reveal any trace of the machine or its occupants and none of the reports were found to be sufficiently substantial to be of material assistance The machine is assumed to have crashed during a monsoon storm in the Gulf of Marta ban and subsequently to have been carried out to sea

An important feature of this case is that a month earlier a heavy landing had been made at Moulmein resulting in among other things a damaged main spar This spar was replaced by one made locally from a local Burmese timber called thitmin In view of the lack of data as to [illegible] h approv ed aircraft [illegible] occurred during sev [illegible] t Tests of this timber (thitmin) are being carried out

There are four possible causes of the loss of the machine therefore—

(1) Structural failure

(2) Engine failure

(3) Exhaustion of petrol

(4) Loss of control while flying low in turbulent conditions

The evidence available is insufficient to determine which of these was the actual cause

Dealing with the accidents generally an attempt has been made in this year s report to analyse the classes and causes of accidents more fully Some accidents can be clearly ascribed to one cause but in others while the pilot may have to bear some of the responsibility, the major portion can be ascribed to some underlying cause such as engine failure at a critical moment or bad weather

In Appendix VIII the 22 accidents which occurred in India are classified according to causes separately for each class of flying deci mals being used to indicate where the cause is divisible between two heads Of the 20 accidents to Indian aircraft pilots errors were res ponsible for 13 5 or 68 per cent engine failure for 1 75 weather for 1 miscellaneous causes such as darkness or bad ground for 75 Of the two cases of structural failure one was an unregistered aeroplane and is dealt with above the other much less serious was due to the collapse of an undercarriage on landing due to incorrect assembly The one undetermined case is due to the machine having disappeared as described above

As regards the accidents to other aircraft in India the undeter mined case is dealt with fully above

as large a share of the responsibility for accidents rests on the ... necessary to analyse ... closely the cause. In Appendix ... has been done in two ways. In the first part the actual cause ... It is ... to ... that the largest indivi... was ... place when landing or approaching. There were ... cases of ... noted that two ... at the same ... accidents ... in hot weather with ... Taking together all cases of accidents con... (except ... ground) there were ... of 135. All the accidents to pilots under training of which ... 23 occurred in connection with landings.

... second part of Appendix IX the underlying causes of pilots' ... have been analysed ... a simplified form of a system which has ... the past year. This allocates the underlying ... (a) Error of Judgment (b) Poor technique (c) Carelessness (d) ... of Rules. In the full form of analysis, these causes are ... analysed to determine what, for example, lies behind an ... judgment. It may be simply lack of experience or lack of special ... or it may be due to physical or psychological defects of a ... or temporary nature. This however is too involved to deal ... detail in this Report.

... technique has the largest individual allocation, most of the ... to pilots under training being ascribed to this cause. Among ... pilots poor technique and error of judgment were responsible ... equal proportion.

... Appendix X the major accidents in Indian Aviation and casualties ... with the hours and miles flown. Nearly half a million ... were flown for each fatality.

SECTION IV. MISCELLANEOUS FLYING AND COMMERCIAL ACTIVITIES

H. E. The Viceroy's Tours. H. E. The Viceroy's Avro 10 aero... was operated throughout the year by the Royal Air Force and ... for the following tours :—

Date	Tour	Distance
		Miles
...ary 1932	Calcutta to Delhi	[illegible]
...h 1932	Delhi to Amballa and back	240
...il 1932		
...ril 1932 / ...y 1932	North West Frontier and Baluchistan	7..0 approx
...ly 1932	Allahabad to Calcutta	[illegible]
...tober 1932	Calcutta to Allahabad	[illegible]
...tober 1932	Delhi—Jodhpur—Ahmedabad—Poona	[illegible]
...ober 1932	Poona—Ahmedabad—Jodhpur—Delhi	[illegible]
...ober 1932	Delhi to Amballa and back	[illegible]40

(2) *De Havilland Aircraft Co , Ltd* —The Indian sales and service branch is still maintained by this firm at Karachi Partly on account of financial stringency the flying clubs replaced some of their aircraft by second hand equipment, and the sales of new aircraft by the De Havilland Aircraft Co shewed a marked reduction During 1932 33 the sales were as follows —

	Value Rs
[illegible]	77,300

The value of sales during 1931 32 was Rs 1,71 350 At the same time five fuselages and airframes, without engines were sold, and one machine was completely built from components in India The repair and overhaul work of the firm made satisfactory progress, major repair contracts being completed on seven D H Moths and one D H Puss Moth

(3) *Imports of aircraft and aircraft material* —The total value of the imports of aircraft and aircraft material into India during the year 1932 was Rs 3 19 064

(4) *Air Survey and Photography* —The only company carrying out this work in India is Indian Air Survey and Transport Ltd , of Dum Dum

During the year 1932 work was continued on the programme of settlement mapping in the United Provinces and Bengal The total area photographed during the year 1932 was 877 5 square miles compared with 2 712 square miles in 1931, but a considerable area of mapping work in addition was completed during the year The flying carried out by the company during the year amounted to 181½ hours

Maps on a scale of 16" to the mile showing the boundaries of every field holding in an area of 1 500 square miles were delivered to the Government of the United Provinces Photographs of an area of 850 square miles on the same scale, rectified for tilt and mounted on zinc sheets to avoid distortion, were delivered to the Government of Bengal preparatory to the preparation of settlement maps The photography of another block of 750 square miles in the Rangpur district Bengal, was completed in December A survey of 30 square miles in the Dacca district was completed in April in connection with the planning of protection works along the Sityalakhia Khal at Naraingani Towards the end of the year a number of tests were made to determine the suitability of Infra Red photography for high altitude work in India An example of this work, taken over Calcutta, is published in this Report

(5) *Indian States* —Apart from developments in Jodhpur, referred to under the heading of the Jodhpur Flying Club, there is a marked indication that flying is being taken up by the Indian States, both by the Ruling Princes themselves and for the general purposes of the State

and private flying The purchase of an aeroplane by H H the Nawab of Junagadh was referred to in last year's report

H H the Maharajah of Patiala, who has long been interested in flying, has purchased a Monospar and engaged a pilot and further aviation developments are contemplated in the State

The Alwar State purchased a Puss Moth and engaged an Indian pilot to improve communications within the State during the unrest which prevailed early in 1933

H E H the Nizam's Government early in 1933, appointed a Civil Aviation Board, and steps were taken to select and acquire land for a civil aerodrome at the capital and to form a flying club which will commence operations during 1933 A programme for the development of commercial aviation within the State is being worked out

SECTION V —ADMINISTRATION

(1) *Civil Aviation Budget* —The provision made for civil aviation in the budget for the year 1932 33 was Rs 8 91 000 This figure was made up as shewn in the following table which also shews the revised figures after readjustments had been made in the course of the year —

——	Budget	Revised
(1) Direction and staff	2 40 400	2 25 200
(2) Works	1 38 100	2 17,100
(3) Grants to clubs	1 30 000	1 12,700
(4) Wireless services	3 20 000	3 20 000
*(5) Other grants for aviation purposes	47 000	43 300
(6) Expenditure in England on leave salaries scholarships recruitment etc	18 500	35 000
	8 91 000	9 53 300

The main change from the Budget figures is due to the carry over of a large volume of work on the preparation of the Bombay (Juhu) aerodrome provision for which was not made in the budget

The final figure accepted in the Civil Aviation Budget for 1933 34 stands at 10 03 000 made up as follows —

(1) Direction and staff	2 81 400
(2) Works	1 66 400
(3) Grants to clubs	1 32 000
(4) Wireless services	3 50 000
*(5) Other grants for aviation purposes	41 [illegible]00
(6) Expenditure in England on leave salaries scholarships etc	32 000
	10 03 000

* Item 5 "Other Grants" consists mainly of a special fund derived from the Road Fund tax on petrol used in aviation the proceeds of which are devoted to experimental work and training

The increases under the heads "Works" and "Wireless Services" represent in part provision for new works and expanding services They are dealt with in more detail under Ground Organisation

(2) *Petrol Tax Fund*—A sum of Rs 42,000 was available in this fund in 1932-33 The fund is earmarked for experimental research and training purposes Funds were allotted to the following objects —

(1) Night lighting of aerodromes purchase of flood lights

(2) Experimental runway on Delhi aerodrome

(3) Training of a pilot instructor

(3) *Helium Research*—The samples of natural gas collected during the preceding year from oilfields in India and Burma are still under analysis by the Indian Institute of Science, Bangalore

(4) *International Conventions*—India was represented at the 20th Session of the International Commission for Air Navigation in Paris by Mr A Dibdin of the India Office A number of the complex questions which come before this Commission have been examined Among these, one of the more important is a new examination of the right of reservation of cabotage

A Convention respecting Air Transport Services has been negotiated between Great Britain and Italy and was finally ratified on the 30th December 1932 on behalf of India as well as Great Britain The Convention defines the conditions on which the regular air services of the contracting parties may operate over each other's territory So far as India is concerned it permits the operation of an Italian service to and from or through Aden

In this connection, it may be noted that although Great Britain, India and Italy are all parties to the International Convention for the ... the aircraft of one contract- ... contracting State, the Con- ... of regular air lines shall be subject to the prior consent of the State flown over

The International Convention for the Sanitary Control of Air Navigation has now reached its final form and is in process of examination and investigation to enable a decision to be reached with regard to the adhesion of India.

The Convention with regard to the liability of air carriers, a Convention, as to liability for damage caused by aircraft to third parties on the ground and a Convention regarding the cautionary arrest of aircraft, all three drawn up by the Comité Internationale Technique D'Experts Juridiques Aeriens, have formed the subject of examination.

(5) *Indian Aircraft Act and Rules*—While progress was made in drafting, it was not possible to present the new Indian Aircraft Bill to the Assembly during 1932

A considerable portion of the Indian Aircraft Rules was revised and a revised edition of the Rules placed on sale The amendments were effected in two Notifications

(1) Notification No T 51, dated the 5th April 1932

This Notification dealt with (1) the registration and marking of aircraft bringing the law on the subject into line with the International Convention for Air Navigation (2) log books making it compulsory to maintain aircraft and engine log books and for aircraft in certain conditions journey log books (3) customs *inter alia* providing for the proper payment of duty on aircraft imported by air

(2) Notification No T 51 dated the 9th June 1932

This Notification revised the whole of the Rules with regard to the licensing of aircraft personnel The rules were brought into line with the requirements of the International Convention for Air Navigation and certain provisions peculiar to India were introduced

(i) The conditions for obtaining a pilot s A licence were made more severe the required number of hours solo flying being raised from 3 to 5

(ii) A limited commercial pilot s licence (A 1) for the carrying of passengers in the neighbourhood of aerodromes in India was introduced This is obtainable after 100 hours solo flying and with less onerous examinations than are required for the B licence

(iii) The conditions of issue of the full commercial pilot s licence (B licence) were also stiffened It is now only obtainable after 200 hours solo flying and at least 5 hours night flying

(iv) A pilot instructor s licence was introduced which is only obtainable after 500 hours flying experience has been gained and after practical and oral examinations have been passed

(v) Provision was made for the issue of navigator s and wireless operator s licences

(6) *Air Navigation in Indian States* —The Summary of Principles adopted by the Chamber of Princes and referred to in the Annual Report for 1930 31 was made effective by the issue of a Resolution by the Government of India

(7) *Prosecutions under the Indian Aircraft Act* —There was one prosecution under the Indian Aircraft Act during the year The pilot a member of the Punjab Flying Club is alleged to have carried out low and dangerous flying over the inhabited area of Lahore which resulted in the crash of the machine and the death of his passenger The pilot was sentenced to a fine of Rs 200 or in default 7 days rigorous imprisonment

(8) *Licences and Certificates* —A statement showing the number of licences and certificates issued during 1932 and comparative figures for 1931 is given in Appendix XI

(9) *Notices to Airmen* —42 Notices to Airmen were issued during the year as compared with 25 during 1931 and 10 during 1930

(10) *New appointments* —Mr N Vintcent D F C resigned in order to take up the post of Manager of the Aviation Department of Tata Sons Ltd and was replaced by Mr A T E Eadon M I Ae E as Deputy Director of Civil Aviation in July 1932 Mr J M Randall was *appointed Assistant Aircraft Inspector in May 1932*

(11) *Aerodrome control* —Extended arrangements were made for the performance of certain duties in connection with air traffic at the landing grounds in Burma by local civil officers The administrative control of the aerodrome at Bombay was entrusted to the Bombay Flying Club At Akyab a wholetime official of the Civil Aviation Directorate was appointed to relieve the Executive Engineer Akyab

(12) *Civil Aviation Scholarships* —During the year 1932 33 only two students remained in England for training as assistant aircraft inspectors These students will complete their course of training in September 1933

SECTION VI —AIRCRAFT INSPECTION

The maintenance of the airworthiness of aircraft is one of the most important functions in the administration of civil aviation It is a problem fraught with much difficulty even in a compact and well organised industrial country and these difficulties are greatly increased *in a country of the dimensions of India having no aircraft manufac*turing organisation

The question has been much debated in all countries whether Government control of the airworthiness of aircraft is a justifiable measure It is pointed out on the one hand that no control is generally imposed on the design or mechanical efficiency of motor cars and on the other

timate development it appeared to those charged with the consideration of this problem in international discussions that the supervision of airworthiness was a necessity The serious result of the structural failure of an aircraft both to the occupants and to persons and property on the ground appeared an adequate reason for meting out different treatment from that accorded to motor cars

The International Convention for the Regulation of Aerial Navigation to which India is a party prescribes that every aircraft engaged *in international navigation shall be provided with a certificate of air-*

Most
while
e fol
sm of

the application of control to private aircraft it is generally accorded that the system of airworthiness investigation and control has been in the interest not only of the public but of the sound development of civil aviation

In India compulsory certification of airworthiness is applied only to aircraft employed for commercial purposes and those undertaking international flights Private aircraft is in this respect left unfettered This policy has been followed and is being continued partly on account of the undeveloped inspection organisation and partly as an experiment—in other words to allow experience to dictate the necessity Many private owners apply voluntarily for airworthiness inspection and thereby come under the same system of supervision as is applied to commercial aircraft A strong incentive to do this is supplied by the requirement that any aircraft engaged in international navigation must be supplied with a certificate of airworthiness Without it no Indian aircraft could fly abroad

In a country like India with no manufacturing organisation a problem of no small difficulty is encountered in the settlement of the standard of airworthiness To establish an independent standard or to verify independently an adopted standard would be impossible without a large technical organisation such as exists in the Air Ministry Airworthiness Department or the Aeronautics Branch of the American Department of Commerce Nor is it necessary while aircraft are not designed and manufactured in India to set up such an organisation The absence of it however makes it necessary to adopt the standard of another country and to rely on the organisation of that country Fortunately this has been possible by adopting the British standard and the greatest help has been at all times received from the Air Ministry Indian certificates of airworthiness are issued for all aircraft which have satisfied the British airworthiness requirements

In adopting the Air Ministry standard it follows that other standards which have not been proved to be the equivalent of that standard cannot be accepted The standards worked to by certain other countries are known to be sound but to differ from the Air Ministry standard It requires special expert staff to determine the differences and the modifications in design necessitated thereby Such a task could not be attempted in India and it is therefore necessary that any foreign built aircraft to obtain a certificate of airworthiness in India must first be accepted for the issue of a certificate of airworthiness by the Air Ministry

Determined efforts are being made in international negotiations to obtain as far as possible a unification of standards of airworthiness The International Commission for Air Navigation have for some years been engaged in the formulation of an international minimum standard In the meantime however negotiations and investigations which were launched at the Imperial Conference in 1930 are proceeding towards the adoption of an Empire standard of airworthiness common to all countries in the British Empire Its adoption will go a long way to

ease the situation in India since aircraft manufactured in any country of the Empire, and exported with a certificate of airworthiness may then be accepted as complying with the Indian adopted standard The remainder of the problem is one of maintenance which is within the scope of the Indian organisation

Negotiations are also proceeding with the United States of America to settle the conditions of mutual recognition of American and British certificates of airworthiness The settlement of these terms will make it possible to import American built aircraft for commercial work in India Pending agreement and the determination of the conditions foreign built aircraft can only be used in India for private flying on which there is no restriction In the case of any particular aircraft, however it may happen that the type has already been accepted for airworthiness purposes by the British Air Ministry or an Indian certificate of airworthiness may be obtained by first submitting the aircraft to investigation by the Air Ministry and obtaining a British certificate of Airworthiness

During the year 1932 33 24 applications were received for issue or renewal of Certificate of Airworthiness for public transport aircraft and 19 for issue or renewal of Certificates of Airworthiness for private aircraft The number of applications relating to private aircraft represents a considerable increase over previous years This is satisfactory as indicating that private owners appreciate the value of inspection and proper maintenance of their aircraft as the principle factor in ensuring safety and obviating accidents from engine failure or structural failure of the aircraft

In order to augment inspection facilities in India an investigation is being made of the possibility of using certain senior Ground Engineers having considerable experience for purposes of actual inspection of private aircraft for renewal of Certificates of Airworthiness partly with this in mind it is the practice to require that all aircraft submitted for Government inspection, should have been previously examined and passed by a licensed Ground Engineer

(1) *Gluing and Welding*—Considerable improvement in gluing technique has been effected by rigorous tests of Ground Engineers Results 50 per cent above the specification requirements were in many cases obtained 65 per cent of the Ground Engineers licensed in Category 'A' and/or 'B' have now qualified in gluing and the remainder are being tested In view of the importance of the process in aircraft repairs it has been decided to make the passing of glue tests compulsory for the holders of licences in categories 'A' and 'B'

Seven batches of test pieces for welding were received during the year, but none were up to standard There are in India at present no approved welding facilities In view of the growing number of metal aircraft in India the matter is of considerable importance

(2) *Timber Tests*—During the year with the co-operation of the Indian Forest Research Institute, deterioration tests have been carried

out on certain aircraft materials and further tests of the deterioration of timber glue and other materials are proposed The results of these when available should be of value to aircraft manufacturers producing aircraft for operation in tropical conditions as well as to prospective purchasers of aircraft who will be enabled to specify methods of construction known to be not unsuitable for operation in tropical conditions

(3) *Investigation of defects* —All defective material and defective
which typical defects
ed to engine failures
e seats cylinder head
valve rocker bracket crankcases and connecting rods Each type of defect has been given very full investigation As a result either improved material design or manufacturing methods have been introduced

(4) *Approved Firms* —The approved distribution procedure has been developed and extended The following firms were approved up to the end of 1932 as distributors of aircraft parts materials etc —

Name of Firm	Purpose for which approved
1 De Havilland Aircraft Co Ltd Karachi.	Supply of aircraft components and materials
2 Indian Air Survey and Transport Ltd Dum Dum	Ditto
3 Messrs Hoosenbhoy Karimji & Sons 170 Napier Road Karachi	Supply of aeronautical publications
4 A R Haseler Bombay	Supply of aircraft components and materials
5 French Motor Car Co Ltd. Calcutta	Supply of aircraft instruments
6 The Dunlop Rubber Co India Ltd Calcutta Bombay and Madras Branches	Supply of aircraft tyres and tubes
7 Geo Miller & Co Ltd Engineers and Agents 7 Hastings Street Calcutta	Supply of aircraft glue
8 Martin & Co Department Bosch Service 58 Free School Street Calcutta	Supply of aircraft magneto spares and for repair and overhaul of aircraft magnetos and magneto parts.
9 Messrs Lucas Indian Service Ltd 2 New Queens Road Bombay	To fit makers approved aircraft magneto spares. (Except rewinding of armatures.)

SECTION VII —GROUND ORGANISATION

(1) *Budget* —The sum of Rs 1 38 100 provided for works services in the Budget for 1931 32 was allocated as follows —

	Rs.
1 Bombay (Juhu) aerodrome preparation	30 000
Maintenance and repairs	80 000
3 Departmental charges	28 100
	1,38 100

This grant was however, increased during the year to Rs 2 11 626 by reappropriations from within the grant for Civil Aviation and by a supplementary grant mainly on account of the carry over of work on the Juhu aerodrome from the previous year The final allocation was as under —

		Rs.
1	Bombay aerodrome preparation	1 10 100
2	Minor works	1 526
3	Aerodrome equipment	5 000
4	Maintenance and repairs	59 376
5	Departmental charges	36 100
		2 12 102

(2) *Bombay (Juhu) aerodrome*—Filling work on the landing area was completed before the monsoon of 1933 The area had to be restricted to smaller dimensions than had been originally contemplated by leaving unmade the North West corner of the site The landing ground as completed provides a run of 800 yards in the North South direction and 800 yards in the East West direction while the east west arm on the northern side is 266 yards and the north south arm on the western side is 300 yards in width The construction of certain other essential works viz chowkidar's hut store compass swinging base garage laying electric cables etc was completed before the end of the financial year

The total cost of the aerodrome is approximately Rs 7 98 372 made up as follows —

	Rs.
Acquisition	3 08 244
Preparation	4 66 698
Buildings roads electric mains water supply	23 430
TOTAL	7 98 372

A hangar of 61 feet span has been erected by Messrs Tata Sons Ltd for the air mail service in the building area adjoining the Bundra Godl under road on the east side of the aerodrome The hangar has been connected with the water, light and telephone mains Bulk storage of petrol has been provided in the vicinity of the hangar by arrangement with the Burmah Shell Co

Applications for other building sites in this area have been invited

(3) *Minor Works*—The following minor works were completed during the year —

Dum Dum Construction of a room in the verandah of the hangar, as an office for the Assistant Aircraft Inspector

Akyab Conversion of a store room into aerodrome office

(4) *Aerodrome lighting* — Two 5 K W mobile flood lights mounted on trailers with self contained generating plants have been purchased and delivered to the Karachi Air Port These flood lights are primarily intended for flood lighting the landing area for night landings but they are also equipped with automatic rotating gear for use as beacons For this purpose the lantern is tilted up to any angle up to 35° from the horizontal in which position a fan shaped beam of light is swept round the sky It is expected that in the climatic conditions of India these rotating beacons will normally be visible at a range of well over 30 miles When the aeroplane reaches the landing ground the rotating mechanism is stopped and the flood light located on the leeward side of the landing ground is depressed to illuminate the ground The beam from the flood light while concentrated into a narrow beam vertically has a lateral spread of 180° The aeroplane lands parallel to the centre of the beam and to one side of the flood light to avoid its own shadow

Flood light operators are undergoing training at the Karachi Air Port Thereafter the flood lights will be located at aerodromes on the air mail route where late arrivals and early starts are made

The flood lights have been purchased from the special fund for experimental lighting and other purposes derived from the two anna road tax on petrol used in aviation

(5) *Indian States* —Many new landing grounds have been constructed in Indian States territory by the Darbars

In Jodhpur alone more than a dozen new landing grounds have been made all marked and provided with wind indicators Two of these are on the main trans India route while at the main aerodrome at Jodhpur a new hangar of 90 foot span has been constructed a first class hotel has been built and many improvements effected

In the Kathiawar States nine new landing grounds have been completed while others have been made in Patiala and the States in the eastern Punjab

(6) *Wireless Services* — No great changes have taken place in the aeronautical wireless service since the last Annual Report The Gaya W/T and D F station and the Delhi and Allahabad D F stations have remained closed The existing Spark wireless station at Victoria Point (Lower Burma) has been modernised by installing a continuous wave transmitter and a direction finding installation Direction finding installations have been completed at Chittagong Sandoway and Bassein

Communication has been established between Rangoon and the wireless station at Laksi (Siam) and through Victoria Point with the wireless station at Penang in the Strait Settlements Along the Mekran Coast west of Karachi messages are exchanged with the wireless station at Gwadar, which is controlled by Imperial Airways Ltd The arrange

ments for reporting the arrival and departure of aircraft along the whole trans India route are now therefore more or less complete

Pending the establishment of additional wireless stations between Rangoon and Victoria Point arrangements have been made for reporting the progress of aircraft landing at aerodromes in this sector by land line

It is also proposed during 1933 34 to fit the air mail machines on the Karachi Madras service with wireless telephony apparatus and to carry out experimental communication with Karachi Bombay (Santa Cruz) and Madras (St Thomas Mount)

A schedule of aeronautical wireless stations in India and Burma and communicating stations in neighbouring countries will be found in Appendices XII and XIII

Proposals are also under consideration for the erection of an aero nautical wireless station at Tavoy (Lower Burma) and it is hoped that funds will be available during the financial year 1933 34 for the com pletion of this station

Arrangements have been made for the regular interchange of meteo rological information between the wireless stations on the air route across India and Burma between Karachi and Victoria Point

(7) *Meteorological Services*—No changes have been made in the main organisation of this service Considerable development has however taken place in the co ordination of the meteorological and wire less services and the aerodrome organisation resulting in weather re ports and forecasts being more readily available to pilots on the ground and in flight

Observations of present weather are regularly made twice a day in the early morning and about noon by the meteorological observers along the trans India route These are transmitted to neighbouring meteorological offices and aerodromes by wireless telegraphy Special observations are made on request and transmitted by wireless to other ground stations and to aircraft in flight Details of this arrangement are given in Notice to Airmen No 18 of 1932 and in Pamphlets which may be obtained from the Meteorological Officers at Poona Calcutta and Karachi

Meteorological forecasts are not made and issued at routine times it being found more effective in the present state of development of air services in India to make special forecasts when required The fore casting centres on the trans India route are at Karachi and Calcutta and forecasts are transmitted by wireless from these stations to other aerodromes and to aircraft in flight on request The arrangements in this connection are set out in Notice to Airmen No 21 of 1932 and in pamphlets which may be obtained from the Meteorological Officers at Poona Calcutta and Karachi

Arrangements were made on the transfer of the Persian Gulf air route to the Arabian Coast on 1st October, for the supply of weather

forecasts and reports for this route, by wireless to various stations on the route and to aircraft in flight

Arrangements have also been made for the preparation and supply of weather forecasts for the Karachi Bombay-Madras Air Mail Service Forecasts for the Karachi-Ahmedabad section are supplied from Karachi, and forecasts for the Ahmedabad Madras section from Poona

A further improvement in the meteorological organisation on the Karachi-Madras air route will be effected during 1933 34, when new upper wind stations will be established at Juhu aerodrome and at several places in the neighbourhood of the Western Ghats While financial conditions do not permit of the organisation of the meteorological service on this route, even to the standard existing on the trans India route, these additional observation stations will contribute materially to the safety of the mail service over this difficult sector of the route

(8) *Air Pilot—India and Burma*—An "Air Pilot" giving full de tails of all ground organisation and services for civil aviation in India has been printed and placed on sale The publication is available for sale in England and India Copies can be obtained in England from the High Commissioner for India and in India from the Manager of Publications 8 Hastings Street Calcutta

(9) *Aeronautical maps*—The preparation of "International local Aeronautical Maps" on a scale of 1 1,000,000 in accordance with the revised Annex F of the International Convention for the Regulation of Air Navigation is in hand The following sheets are now being produced by the Director of Map Publication —

N H 43	Punjab, Punjab States Rajputana U P
N G 43	Punjab, Punjab States, U P, Rajputana, Ajmer Merwara, Gwalior, Bombay, Western India States and Baroda
N G 44	U P, C P, C I, B & O, Rajputana, Gwalior, Nepal

APPENDIX I

Karachi Bombay Madras Air Mail Service

(Commenced 15th October 1932).

Period.	Aircraft Flights			Aircraft Mileage	Passengers		Freight	Mails	
	Scheduled.	Completed	Percentage Regularity		Actual	By stages		South bound.	North bound
			Per cent				lbs.	lbs	lbs
October	6	6	100	7 920				378	4[illegible]3
November	8	8	100	14 [illegible]80	1	2	38	476	4[illegible]7
December	[illegible]	[illegible]	100	13 2[illegible]0			15	610	[illegible]00
Total	23	23	100	3[illegible]720	1	2	53	1,464	1[illegible]10

APPENDIX II

Delhi-Karachi Air Mail Service

Period	Aircraft Flights			Aircraft mileage	Passengers		Freight	Mails		Remarks
	Scheduled	Completed	Percentage Regularity		Actual	By stages		West bound	East bound	
			Per cent				lbs	lbs	lbs	
1932, March Quarter	26	26	100	17,940	2	2		1,157	1,283	
,, June Quarter	26	24	92	17,940	2	3		1,004	1,399	One engine failure, One weather
,, September Quarter	26	25	96	17,940	1	2		1,080	1,464	One weather
,, December Quarter	26	26	100	17,940	1	1		1,489	1,190	
Total	104	101	97	71 760	6	8		4,730	5,336	

Note —Flights on which the air mail connection at Karachi was missed are shewn as uncompleted, in each case the flight was completed later Mails carried on these flights are not included

APPENDIX III

Regular Air Services Karachi Air Port

Services and Period	Eastbound Arrivals						Westbound Departures					
	Scheduled flights	Punctual	Delay			Cancelled	Scheduled flights	Punctual	Delay			Cancelled
			1 day	2 days	3 days or more				1 day	2 days	3 days or more	
1931—1st Quarter Imperial Airways	13	11	2				12	9	3			
K. L. M.												
Air Orient												
1931—2nd Quarter Imperial Airways	13	8	2	2	1		14	14				
K. L. M.	7	6	1				7	6	1			
Air Orient	5	3	1	1			4	4				
1931—3rd Quarter Imperial Airways	13	11	2				13	10	1	2		
K. L. M.	6	6					6	2	3		1	
Air Orient	7	5	1	1			7	7				

APPENDIX III—*contd*

Regular Air Services Karachi Air Port—contd

Services and Period	Eastbound Arrivals						Westbound Departures					
	Scheduled flights.	Punctual	Delay			Cancelled	Scheduled flights	Punctual	Delay			Cancelled
			1 day	2 days	3 days or more				1 day	2 days	3 days or more	
1931 —4th Quarter												
Imperial Airways	13	5	2	4	2		14	10	2	1	1	
K. L. M	13	4	4	2	3		11	10	1			
Air Orient	6	5	1				6	2	3	1		
1932 —1st Quarter												
Imperial Airways	13	7	2	2	2		13	13				
K. L. M.	13	2	9	2			13	11	2			
Air Orient	7	6	1				7	7				

193? —2nd Quarter												
Imperial Airways	13	10	1	2			13	13				.
K. L. M.	13	10	2	1			13	11	2			
Air Orient	10	6	4				10	7	1	2		-
1932 —3rd Quarter												
Imperial Airways	14	14					13	11	1		1	
K. L. M	13	11	1	1			13	12		1		
Air Orient	13	10	1	2			13	7	4	1	1	
193? —4th Q arter												
Imperial Airways	13	5	3	3	2		13	13				
K. L. M	13	9	1	2	1		13	9	2	2		
Air Orient	13	11	1	1			13	10	3			

APPENDIX IV

Regular Air Services to India 1932

Air Mails to India

—	Imperial Airways		K L M		Air Orient		Total
	Ordinary mails	Transit mails	From Europe	From the East	From Europe	From the East	
	lbs	lbs	lbs	lbs	lbs	lbs	lbs
1929 9 months	21 967	16					21 983
1930	39 364	359	96				39 819
1931	45 632	840	1 047	No record	318	No record	47 837
1932 March quarter	10 376	259	657	211	66	2	11 571
1932 June quarter	9 835	338	684	282	120	12	11 271
1932 September quarter	11 701	501	835	329	121	23	13 511
1932 December quarter	13 199	668	1 040	544	151	42	15 643
Total 1932	45 111	1 766	3,216	1 366	458	79	51 996

Air Mails from India

—	Imperial Airways		K. L. M	Air Orient	Total
	Ordinary mails	Transit mails.	To the East.	To the East	
	lbs	lbs	lbs	lbs	lbs
1929 9 months	20 171	485			20 656
1930	34 015	2 561			36 576
1931	40,474	2 592			43 066
1932 March quarter	9,869	907			10 776
1932 June quarter	9 891	990			10 881
1932 September quarter	10 863	1 076			11 939
1932, December quarter	11 [illegible]84	1 326	117	14	13 [illegible]41
Total	42 407	4 [illegible]99	117	14	46 837

APPENDIX V

Traffic return of regular air services to and from India (Karachi) excluding Air Mails

—	No. of flights	Passengers.		Freight (including Bullion)	
		To India	From India	To India	From India
Imperial Airways					
1929, 9 months	80	No record.	No record.	No record.	No record
1930	105	78*	70*	No record.	No record
1931	104	80†	74†	5 489	313
1932, March quarter	26	43	33	1,228	204
1932, June quarter	26	19	46	1,178	2
1932 September quarter	27	43	37	1,461	28
1932, December quarter	26	45	26	1,206	32
Total	105	150	142	5 073	266

Foreign Services					
1931	106	32†	18†	628‡	43‡
1932, March quarter	40	—§	—§	136	1,150
1932, June quarter	46	9	13	106	88
1932 September quarter	52	2	8	425	342
1932, December quarter	52	5	9	564	1,106
TOTAL	190	16	30	1,231	2,686

* Figures for the financial year 1930 31
† No figures for the first quarter figures relate to the last nine months
‡ No figures for the first half year
§ Not known

Traffic return of regular air services to and from India (Rangoon) excluding Air Mails.

—	No of flights	Passengers		Freight	
		To India	From India	To India	From India.
Foreign Services					
1932 March quarter	38	1	8	.	..
1932 June quarter	46	12	5	115	.
1932 September quarter	52	8	2	1	5
1932, December quarter	54	20	13	12	1,346
TOTAL	190	41	28	128	1,351

APPENDIX VI

Indian Air Ports

—	Aircraft		Imports by air		Exports by air	
	Arrivals from foreign	Departures for foreign	Merchandise	Bullion and currency notes	Merchandise	Bullion and currency notes
			Rs	Rs	Rs	Rs
Karachi						
1931 March quarter	28	22				
1931 June quarter	31	32				
1931 September quarter	27	25	1 50 601	1 06 801	4 286	10 00 000
1931 December quarter	36	32				
Total	122	111	1 50 601	1 06 801	4 286	10 00 000
1932 March quarter	43	36	54 734		8 277	2 00 000
1932 June quarter	43	41	32 345		2 125	
1932 September quarter	45	40	1 72 435		2 884	
1932 December quarter	43	44	1 49 742	33 766	1 842	
Total	174	161	4 09,256	33 766	15 128	2 00 000

Rangoon						
1931, March quarter	10	15	Nil	Nil	Nil	4 54,790
1931, June quarter	14	16				
1931, September quarter	15	14				
1931, December quarter	18	20				
TOTAL	57	65				4 54,790
1932, March quarter	19	22	48			8,57,180
932, June quarter	23	28	220	•		1,15,446
932, September quarter	26	28	366			2,10,521
932, December quarter	28	29	1,174		225	10,75,416
TOTAL	96	107	1,808	•	225	22,58,563
Bombay						
932, March quarter						•
932, June quarter						
932, *September quarter*			4,17,169*			
932, December quarter	1		553			•
TOTAL	1		4,17,722			
Calcutta †						
ugust to December 1932	36	Not available	4 637‡	Not available	Not available	Not available

* Diamonds.
† Goods landed by aircraft at Karachi, but assessed for duty at Calcutta, Rs 1,223
‡ November and December

APPENDIX VII

Summary of the work of the Flying Clubs during the year 1932

Flying Clubs	Number of Members: Total	Flying Members: European	Flying Members: Indian	Aircraft: Number	Aircraft: Type	Ab initio pilots qualified for 'A' licence: European	Ab initio pilots qualified for 'A' licence: Indian	Number of hours flown: Instruction hours	Number of hours flown: Other flying hours	Number of hours flown: Total
Delhi	226	45	60	4	D H Moth Gipsy I	5	9	594	1,072	1 666
Cawnpore	102	12	9	1	D H Moth Gipsy II	2	1	152	295	447
Lucknow	94	11	23	1	Bluebird—Gipsy I		3	223	356	579
Bombay	264	44*	79*	4	D H Moth Gipsy I	7	12	853	1,434	2 287
Madras	267	22	8	3	2 D H Moth Gipsy I 1 D H Puss Moth Gipsy III	9	3	465	806	1 271
Bengal	323†	79†	47†	4	D H Moth Gipsy I	12	9	525	1 142	1 667
Karachi	144	28	61	3	D H Moth Gipsy I	6	6	324	580	904
Kathiawar	118	Not available		3	1 D H Moth Gipsy III 1 D H Puss Moth Gipsy III 1 Bluebird Gipsy II		1	95‡	164‡	259‡
Jodhpur				2	D H Moth Gipsy I				339	339
Punjab				1	D H Moth Gipsy II Closed April 1932			138§	160§	298§
TOTAL	1 538	241	287	26	TOTAL	41	44	3 369	6 348	9 717

* Figures for the month of January 1932
† Figures for the month of November 1932
‡ Figures for the period July December 1932
§ Figures for the period January April 1932

APPENDIX VIII

Accidents in India

ANALYSIS OF CAUSES

Type of flying	Pilot		Engine	Structure	Weather	Miscellaneous	Undetermined	Total
	Licensed	Under training						
Indian aircraft								
Flying—								
ombay	3						1	4
lh	[illegible]		75					1
wnpore	5		5					1
k ow		1						1
l	1 5		5					2
al	1	1						2
l r	1	[illegible]				5		[illegible]
awar	1			1				[illegible]
TOTAL CLUBS	8[illegible]	[illegible]	1 [illegible]	1		[illegible]	1	15
[illegible] flying —								
[illegible] el	[illegible] 7[illegible]					[illegible]5		3
[illegible] l aeroplane				1				1
[illegible] air transport—								
[illegible] nal service					1			1
TOTAL INDIAN AIRCRAFT	11	[illegible]	17	[illegible]	1	7	1	[illegible]0
Non Indian aircraft								
[illegible] flying	1						1	[illegible]
TOTAL IN INDIA	1[illegible]	[illegible]	17[illegible]	[illegible]	1	7	[illegible]	[illegible]

APPENDIX IX.

Accidents—Indian Aircraft.

ANALYSIS OF PILOTS' ERRORS.

I.

Cause	Licensed *Pilots*	Pilots under Training	Total
A Solely pilots' errors			
(1) Stall when landing or approaching .	4	..	4
(2) Bad landing . . .		1	1
(3) Collision with obstacles in full flight	2		2
(4) Collision with obstacles landing .	75	1	1 75
(5) Collision while taxying .	1	.	1
(6) Stall while stunting .	1		1
B Pilots errors following other prime caus.			
(7) Stall following engine failure taking off (2 accidents)	75		75
(8) Landing partially out of control in forced landing (2 accidents)	5	5	1
(9) Landing on bad ground in forced landing (1 accident)	1		1
TOTAL—PILOT RESPONSIBILITY .	11	2 5	13 5
TOTAL ACCIDENTS—PILOT INVOLVED .	13	3	16

II.

Cause	Licensed pilots.	Pilots under training	Total
(a) Error of judgment	4 0	..	4 0
(b) Poor technique	4 0	2 0	6 0
(c) Carelessness	2 0	5	2 5
(d) Disobedience of Rules	1 0	.	1 0
	11 0	2 5	13 5

APPENDIX X.

Major Accidents—Indian Aircraft

—	1932
(1) Aircraft hours flown	11 550
(2) Aircraft miles flown (approx.)	992 000
(3) Accidents involving fatalities—	
(a) Crew	1
(b) Passengers	1
(c) Other persons	
(4) Non fatal accidents involving injuries—	
(a) Crew	2
(b) Passengers	
(c) Other persons	
(5) Number of killed—	
(a) Crew	1
(b) Passengers	1
(c) Other persons	
(6) Number of injured—	
(a) Crew	2
(b) Passengers	
(c) Other persons	
(7) Miles flown per fatality	496 000
(8) Miles flown per injury or fatality	248 000

APPENDIX XI.

Licences and certificates issued and current during 1931 and 1932

Licence and certificate	Issued during 1931	Issued during 193?	Total Issued to end of 193_	Lapsed to end o 1932	Current on 31st December 1931	Current on 31st December 1932
Pilot s A Licences	123	104	387	191	197	196
Pilot s A Licences (Limited commercial p lot)		5	5			5
Pilot s B Licences	18	12	95	68	24	27
Pilot Instructors Licences		12	12	2		10
Ground Engineer s Licences	9	7	47	?8	19	19
Certificates of Airworthiness	14	18	77	48	25	29
Certificates of Registration*	27	19	119	48	65	71

* The figures include only new certificates issued Figures of aircraft re registered have been ecluded

APPENDIX XII

Aeronautical Wireless Stations in India and Burma.

Station and call sign	Geographical position of Transmitter	Transmitter power	Normal Wave length in metres	Type of D F installation	Position of D F. apparatus from nearby aerodrome or town
Karachi VWK	24° 51' 5" N 67° 2' 32" E	6 KW CW	900 metres also 600 metres when required	Marconi Adcock	Near Civil Aerodrome, *Drigh Road*, east of Karachi
Jodhpur VWJ	20° 15' 20" N 73° 2' 23" E	3 KW CW	900 metres	Marconi (Bellini Tosi)	Close to Civil Aerodrome on S W. side
*Delhi VWD	28° 39' 15" N 77° 14' 30" E	6 KW CW	900 metres	**Nil*	
**Allahabad VWA*	25° 26' N approx 81° 5' E	3 KW CW	900 metres	**Nil*	
Calcutta VWC	22° 33' 31" N 88° 20' 16" E	6 KW CW	900 metres also 600 metres when required	Marconi (Bellini Tosi)	At Tollygunge South of Calcutta
Chittagong VTC	22° 21' 39" N 91° 48' 27" E	1½ KW CW	900 metres	Marconi (Bellini Tosi)	At transmitter
Akyab VTA	20° 8' 41" N 92° 52' 16" E	3 KW CW	900 metres	Marconi (Bellini Tosi)	At transmitter 1 mile N W of Aerodrome
Sandoway VTS	18° 29' 14" N 94° 21' 9" E	1½ KW CW	900 metres	Marconi (Bellini Tosi)	At transmitter
Bassein VTX	16° 47' 39" N 94° 45' 40" E	1½ KW CW	900 metres	Marconi (Bellini Tosi)	At transmitter
Rangoon Aerodrome VTW	16° 57' 30" N 96° 7' 48" E	6 KW CW	900 metres	Marconi Adcock	Close to and S of Aerodrome *Prome Road*
Victoria Point VTV	9° 59' 15" N 98° 33' 15" E	3 KW CW	900 metres	Marconi (Bellini Tosi)	At transmitter

NOTE.—Hours of watch are published in a separate Instruction. The current Instruction should be consulted.
* The D F stations near Delhi and Allahabad have been closed.

APPENDIX XIII.

Aeronautical Wireless Stations in neighbouring countries.

Station and call sign.	Geographical position of transmitter.	Transmitter power	Normal Wave-length in metres	Type of D. F. installation	Position of D. F. apparatus from near by aerodrome or town.
			Mekran Coast.		
Gwadar VTG	25° 7′ 39″ N 62° 18′ 55″ E	½ KW	900	*Nil*	....
			Siam.		
Laksi HSLS	13° 52′ 44″ N 100° 34′ 35″ E	(Unknown)	900	(Type unknown)	Near Donmuang Aerodrome, Bangkok.
			Straits Settlements		
Penang VPX	50° 32′ 03″ N 100° 22′ 51″ E	3 KW	900	*Nil*	...